Fashion history

Garments and adornment of protection: ancient origins and future trends

Daniel James Cole

Abstract

Clothing and personal adornment has long been a function of protection, and specifically for our purposes protection against harm and injury. This has included of course armor, but also garments, accessories and body art that are imbued with powers of protection. The Hamsa and the Eye of Horus amulet symbols both include the eye of God and are thought to deflect the evil eye. The full body tattoo traditions of many Polynesian tribes are thought to be a second skin of protective armor against injury or harm. The shirts of the Ghost Dance movement of the Plains Indians were thought to be impervious to the bullets of the white man, which was proved sadly wrong at Wounded Knee. In our present society we see great interest in protective items. One of these includes the revival of body art and amulets for spiritual protection. Of a more concrete nature however is the development of clothing that is being manufactured for the increasingly complex aspects of modern warfare and terrorism. A union of design, war fighting strategies, and technology is combining for major advances in this type of clothing, and the development of these garments is even more important as global unrest continues. Advances in these technologies by major companies such as Blücher/Tex-Shield, Dupont and Pinnacle Armor are examined. Our society could quite possibly be one terrorist dirty bomb away the marketing of such apparel at places like Sears, or Kmart; possible the higher end versions affordable to the elite could be in 'protection collections' departments at the likes of Neiman Marcus, Barney's or Holt Renfrew. If these outfits transfer from techno warfare to civilian usage, could sending this down the runway be in our future? Could Roberto Cavalli someday be doing delightful appliqué patterns on chemical warfare suits?

Keywords: protection, technology, warfare

Introduction

Michael and Ariane Batterberry published the text *Mirror, Mirror: A Social History of Fashion* in 1977. They proposed four basic principles of fashion and adornment. Included in this list were "Exalt the Ego" – dressing and grooming to feel good and to make oneself feel important; "Arouse Emotion" – wearing clothing and adornment as a means of seduction or intimidation; "Communicate by Means of Symbols" – garments and accessories that give information about ourselves; and the fourth principle, "Protection." Protective clothing can be seen in our world in any number of forms. Football players use shoulder pads, helmets and genital cups. Sport fencing requires masks and special padded suits. Oven mitts are found in our kitchens to protect our hands from extreme heat; safety goggles are found in many of our garages for tasks that pose some threat to eye safety.

Self-protective instincts were one of the primary factors in the development of dress[1]. Protection from the elements was surely one of humanity's earliest motivations for clothing. This could have manifested itself as body coverings to protect from cold, rain, and snow, from dust and sand, sunlight, water, or falling debris. Also, threats of injury, personal safety and death from predatory animals or accidents were part of the human condition. In addition to these threats there was also the threat of intended physical harm by another person, and acts of aggression from another tribe against one's own. Of specific interest to this research is protective clothing motivated by acts of aggression that provides protection from weapons and warfare. As civilization developed enough to wage battle and organized war, then another category of protective wear begins with armor and related body coverings, which are discussed below. But as armor developed, so did protection in the form of amulets.

Amulets of protection

The Batterberrys also point out: "From the earliest times articles of clothing were worn to ward off demons. Primitive man, convinced that hostile forces lurked everywhere, took all possible precautions to avoid the dispensation of fresh calamities."[2] The idea of hostile forces lurking everywhere is a feeling akin to life in our contemporary world, perhaps especially life in New York City, London, or Baghdad.

The ancient and tribal world developed many accessories and garments with the amuletic powers noted by the Batterberrys. The Hamsa of Ancient Mesopotamia (Figure 1) and the Eye of Horus of the Egyptians (Figure 2) are amulet symbols that both include the eye of God and are thought to deflect the evil eye. Wearing these amulets would bring protection to the wearer from outside harm. Vikings wore amulet runes into battle and we see very specifically their use as protection in combat situations with the aeishjálmur (or 'helm of awe') (Figure 3) and the mjolner (or 'Thor's hammer') (Figure 4). The full body tattoo traditions of many South Pacific tribes have many functions including hierarchy and seduction, but in some instances are thought to be a second skin of protective armor against injury or harm. The shirts of the Wavoka Ghost Dance movement of the Plains Indians in the late 19th Century were typically decorated with many amulet symbols, and were believed by some of their wearers to be impervious to the bullets of the white man. This was proved sadly wrong at the Wounded Knee Massacre. A crucifix in the Christian world can give protection to its wearer, at least, in the gothic folklore of central Europe, to ward off attacks of vampires.

Figure 1.

Figure 2.

Figure 3.

Figure 4.

Armor

As noted above, as civilization developed enough to wage battle and organized warfare, then a specialized category of protective wear begins with armor. Over the centuries, forms of armor have developed in a variety of ways and fabrications. The history of armor is familiar to most scholars of clothing history or even the casual History Channel viewer. Throughout the centuries of its usage, armor developed as a response to changing weapons technologies. Spears, arrows, swords, and throwing axes were all among the weaponry that armor was designed to combat. Throughout time, armor also exhibited an intertwined relationship with fashion, as well as an intertwined relationship with spiritual amulets.

Figure 5.

Figure 6.

Figure 7.

Armor history

Leather armor was typical of Mesopotamia and Central Asia. The scaled design seen on the example shown in figure 5 was typical and offered some degree of flexibility. The Assyrians developed another flexible form of armor by lacing together bronze plates. Chain mail, a series of linked rings, was probably invented by the Celts. During the same time period we see great achievements made in plate armor in Ancient Greece (Figure 6). Many protective qualities were enhanced by this plate armor, but flexibility was reduced. Later Greek and Etruscan examples had metal plates on leather bases. The Romans took from all of these earlier technologies; they combined plate armor, mail, and variations of scaled armor. They combined plate armor, mail, and new variations of scaled and articulated armor (Figure 7) creating more sophisticated combinations of protection and flexibility. Simplified forms of Roman combinations dominated the Dark Ages, with mail being particularly common, and with the late Middle Ages came more sophisticated combinations of mail and plate armor. By the Renaissance, articulated suits of multi-piece armor were the state-of-the-art form. These suits continued into the 16th and 17th Centuries and are perhaps the highest point in the history of armor. During the 17th Century, with changes in both warfare and weaponry, the use of armor waned and use of the buff coat became prevalent. Armor continued into the 19th century in a vestigial form – that of the gorget neckpiece, but by then its usage was not practical but for symbolic and hierarchical purposes.

Armor and fashion

While primarily intended for protection, armor has consistently been a reflection of the style and aesthetics of its period. The Greeks created armor helmets based on fashionable hat shapes of the time, such as the Phrygian cap (Figure 8). Stylized forms of armor developed in many periods intended for non-combat situations where they were worn for ceremonial and hierarchical purposes. This is most clearly evident in pieces known as 'parade' armor. This tradition was typical among the Romans where military pomp and circumstance was commonplace for civilian spectators. Fashion influenced decorative armor is particularly common in the 15th and 16th Centuries. Examples of armor can be seen exhibiting elements of high fashion rendered in metal (Figure 9). These include armor versions of fluting, the peasecod belly, poulaines and duckbill shoes, slashing, bases, and even armor codpieces. Armor makers such as the great Venetian Fillipo Negroli applied decorative elements in excess when the individual armor suits became less about function and more about status (Figure 10). As in the Roman practice, these would have been for ceremonial occasions as opposed to strictly warfare contexts.

Figure 8

Figure 9.

Figure 10.

Figure 11.

Armor and amulet symbols

As noted earlier, the Vikings specifically decorated themselves with amulet runes when going into battle. Armor has also been a vehicle for amulet display and religious iconography, showing evidence of a combination of the concrete protection provided by the armor and the abstract protection provided by the spiritual symbols. Humankind has consistently sought to amplify the power of one form of protection with the other. This relationship is clear throughout the history of armor. For example, the gorget (or *aegis*) in ancient Greece was often decorated with the image of a mythological diety for added protection (Figure 11) and the Greeks often similarly adorned their shields and cuirasses.

This phenomenon was the subject of the 1996 Metropolitan Museum of Art exhibit *The Gods of War: Sacred Imagery and the Decoration of Arms and Armor*. In the accompanying catalogue, Donald J. LaRocca states that

> "Sacred imagery is one of the few themes, perhaps the only truly universal theme that manifests itself in the form and ornamentation of armor and weapons from cultures around the world. …the inclusion of religious symbols imparts a specific message. Such symbolism appears in many forms, including figural depictions of particular gods, saints, and spirits, as well as religious and talismanic emblems, words, and phrases."[3]

In the Byzantine mosaics at Ravenna, a soldier is depicted with the Chi Rho symbol on his shield (Figure 12). This is of course evidence of the lack of separation of church and state in the Byzantine Empire, but is also indicative of the protection of Christ being taken into battle. The soldier has the combined protection of the shield and the Chi Rho, and the powers of the shield are enhanced by the amulet usage. A plate armor cuirass from the 16th century in the Metropolitan Museum of Art depicts the crucifixion of Christ. Separated by about a thousand years, the combination of armor and Christ is the same phenomenon as the Byzantine shield (Figure 13). In both of these examples we see the combination of a practical protection technology – the shield or the cuirass - with the amuletic protection – the image or symbol of Christ. Templar knights during the Crusades wore cross-emblazoned tabards over mail shirts; the typical sword became the sign of the cross for European Christians when viewed vertically (Figure 14).

Figure 12.

Figure 13.

Figure 14.

Figure 15.

Amulet and spiritual power added to armor also includes sacred text. The collection of the Metropolitan Museum of Art includes an Indo-

Persian cuirass with text from the Qur'an (Figure 15). As is common in other Islamic artistic contexts, the decoration here avoids the depiction of figures and the Islamic sacred iconography takes its form in the words of Mohammed; the written text takes on the same weight as the symbols and imagery of the Christian examples.

The combining of armor with amulet protection indicates and underlines a common goal of these two categories of protective clothing.

The dawn of modern warfare

As the world modernized so did war, and so did humankind's protective clothing. Firearms become more prevalent throughout the 18th century and into the 19th century, and a new kind of warfare developed dominated by gunfire. By the late 19th century this was combated with a new and developing type of armor, bulletproof vests, as well as new types of helmets. Chlorine and mustard gas were first used during the 1900s and 1910s, and were important lethal agents during World War I. The gas mask was first developed at that time, as was chemical protection outerwear in the form of rosin oil treated fabrics. It was also during this time that camouflage became used regularly. Nerve agents began in the 1930s and continued to develop during the course of the century. Arial warfare and development of armored vehicles were other changes of the early 20th century. Nuclear weapons and biological weapons are also both products of the 20th century. Today, nuclear, biological and chemical toxins, combined with conventional warfare artillery and explosives are the basis for the protective clothing needs in warfare. They constitute three basic categories: ballistic protection or body armor, heat and flame protection, and toxin protection, and these forms of protection are combined in different forms based on the needs of the user.

Body armor

Bulletproof vests, or body armor, are upper body protective coverings designed to deflect or absorb impact from bullets and shrapnel. They are graded in 7 categories (Type I, Type IIA, Type II, Type IIIA, Type III, Type IV, and Type V). The level indicates the strength and degree of protection provided. Type II and below are fabric armors; levels above Type II involve additional plates of various materials. Heavier forms of body armor are made for bomb disposal squads and offer even higher degrees of protection. The technology of bullet protection usually works

not by deflecting a bullet but by absorbing the shock of the bullet and dispersing it over a wider area, flattening out the tip of the bullet, commonly called 'mushrooming.'

Bulletproof vests originated in a silk form in the late 19th century. The use of silk for bullet resistance was probably discovered accidentally but soon multi-layered silk vests were being marketed. During the early 20th century, steel versions resembling historic armor were introduced, but they were too heavy and restrictive to be fully practical. World War II saw the development of the flack jacket, but it was only useful for stopping shrapnel, and not capable of stopping bullets. Also during World War II, the US and the Soviet Union both made some progress in the development of bulletproof body armor. During the beginning of the Vietnam War new materials such as fiberglass, ceramics, and nylon were used but success was not significant. Changes occurred in the late 1960s with the introduction of quilted nylon vests with multiple steel plates, created by American Body Armor (still and industry leader) and further advances were made with combinations of steel and ceramic plates, called ballistic panels.[4] DuPont Kevlar® aramid synthetic fiber was introduced in the 1960s and 70s. In 1999 The Natick Soldier Institute and Point Blank Body Armor introduced the Interceptor Multi Body Armor System. It utilizes DuPont Kevlar® fabric with a type of ballistic panel made of ceramic compounds, the 'Small Arms Protective Insert' (or SAPI plate.)[5]

Further advances with high performance textiles (such as Dyneema, Kevlar Protera, GoldFlex and Twaron) along with nanotechnology are being applied to body armor design today. Prominent makers in the US include T.G Faust Inc., Lifetek Armor, and Pinnacle Armor. There are two important Canadian manufactures, Ten4 (formerly Atlantic Body Armor) in Laurieville, Quebec, and Ceramic Protection Corp. in Calgary. CPC was the recent recipient of a $15.4 million contract for the USMC for ballistic panel inserts.

Pinnacle Armor Dragon Skin®

The most exciting recent development in body armor is Dragon Skin® from Pinnacle Armor of Fresno, CA. This product really is the state-of-the-art at this time. Dragon Skin® has ballistic capabilities available in Level III, Level IV and Level V protection. Defense Review.com called it "Significantly superior, ballistically and durability-wise." [6]

Figure 16.

Figure 17.

Figure 18

According to Pinnacle Armor's website, it is "the first practical, flexible body armor that defeats rifle rounds." This flexibility comes from a design of overlapping scales on the protective insert (Figure 16). The scales are made of a ceramic composite and are about the size of a US silver dollar or a Canadian Toonie. The scale inserts are actually oddly beautiful and the resemblance to scaled leather armor of the ancient Mesopotamians and Central Asians (Figure 5) is striking. The scaled design is also an improvement of over the typical ceramic ballistic or SAPI plate in that they are less fragile. Some companies are trying to compete with SAPI plates of softer materials but all of the advantages of Dragon Skin® have not been matched. Although heavier than some more conventional styles, the flexible scale design actually distributes the weight of the protective insert in such a way that the extra weight is compensated. The protective coverage is also increased. The weight distribution and the flexibility keep the vest tighter to the body.[7] According to a Pinnacle Armor spokesperson: "Everyone else generally uses 8" x 10" or 10" x 12" solid plates covering only vital organs. So not only is ours flexible, but the amount of rifle protecting coverage on our vests is drastically increased, wrapping around the entire torso, up under the arms to the armpits, up to the neck for upper respiratory protection.[8] The scaled design also molds to individual bodies far more effectively than conventional types of armor adding to the wearer's ease of movement. This is particularly important given the physical requirements the men and women of our armed forces and police forces are required to do such as "rappelling, fast roping, diving, entry work, sky diving or other rigorous activities."[9] A water resistant version is also available.

The vests that hold the scaled armor sections (Figures 17, 18) come in a variety of color options which include the expected black, woodland camouflage, and desert camouflage. Also included is the color choice

'Coyote Tan', a color name worthy of the J. Crew catalogue, showing an influence from the world of fashion with the practice of creative color name copywriting.

The Discovery Channel's *FutureWeapons* recently tested the ballistic capabilities of Dragon Skin®. In addition to the normal firearm testing, *FutureWeapons* producers did a test with a direct grenade explosion and even with this the armor showed remarkable resistance to the impact.

The helmet

Head armor or helmets have continued to develop as well during the 20th century. Metal has been the dominant material but in recent decades advances have been made in many of the same synthetic fibers used in body armor, including DuPont Kevlar®, and Twaron. As mission demands become more complex, more and more technologies are being incorporated into helmets. Many other technologies, such as night vision and lighting, are mounted on or incorporated into the helmet. Communications have been incorporated into helmets for several decades. As helmets continue to develop, the priorities are the same as they are for body armor: increased flexibility, increased performance, and decreased weight. DuPont continues to make advances in helmet technologies. Gentex Corp. is also an industry leader in helmets, and has manufactured helmets for several branches of both US and Canadian armed forces for over fifty years.

NBC protection and heat protection

Current protective clothing is being manufactured for the increasingly complex aspects of modern warfare and terrorism. A union of design, war fighting strategies, and technology is combining for major advances in this type of clothing, and the development of these garments is even more important as global unrest continues. The most notable impact on protective clothing design today is the threat of nuclear, biological and chemical (NBC) toxins that are increasingly part of the nature of war and terrorism. New fabric technologies developed in the past few years are contributing greatly to the design of NBC protective clothing, and the demand is for both NBC and heat protection combined in one suit. New technologies are also bringing advances in chemical protection masks (formerly called gas masks.) Several companies today are competing and developing significant improvements in this market.

The customer is primarily military, but variations on the technology are needed more and more for potential first responders to terrorist attacks. This accounts for increased sales to civic organizations such as EMS and police forces as homeland security needs increase.

Joint Services Lightweight Integrated Suit Technology (JSLIST)

Entering the 1990s, chemical defense used in the US armed forces was known as the Battle Dress Over-garment (BDO). This was heavy and bulky and could not be laundered. The NBC protection took the form of a heavy charcoal liner. The Marine Corps began developing lighter weight suits. Soon the Army began similar testing, and shortly the Navy and Air Force combined with the Army and Marine efforts. This became the Joint Services Lightweight Integrated Suit Technology (JSLIST) program. Each branch of the armed forces added their specific unique service requirements. The Department of Defense sought out both domestic and foreign technologies. The goal was a lightweight, washable, durable material that protected against chemical penetration and reduced heat stress; later the requirement of protection from toxic aerosols was added. During 1996 and '97, 13 different companies submitted suits made from 57 different materials. Five of the 57 materials were deemed qualified to enter phase 2 of the test, which included field-testing at 10 different global locations. The contract to produce the fabric for the JSLIST suit was awarded to Blucher GMBH and its American subsidiary and distributor, Tex-Shield Inc. Other companies that submitted sample products for testing included Gentex, and DuPont subsidiary Lanx. Congress has raised concerns that approved JSLIST material has a sole source.[10] Chemical protection masks and specially designed boots and socks complete the full JSLIST ensemble.

Blücher/Tex-Shield

Tex-Shield Inc., located in Washington D.C., is a subsidiary of the German company Blücher GMBH. The Von Blücher family has a colorful history in warfare. General Gebhard von Blücher fought Napoleon at Leipzig in 1813 and Waterloo in 1815. Future generations of the Von Blücher family were involved in the development of chemical warfare in Germany for Hitler. A 2003 New York Times article profiled the life of the then 61-year-old Hasso Von Blücher, along with the advances of his company.

> "The company's secret is a layered design that uses thousands of tiny beads of extremely adsorbent carbon, which trap lethal chemical substances but allow air to circulate around the body (fig. 19). The system, known by the trade name Saratoga, makes the suits lighter and cooler than their bulky predecessors." [11]

Von Blücher stated at that time that developing more and more products suited to the United States emergency workers in the event of a terrorist attack was a major priority to him and the company. "The civil defense industry is a growing business...the first responders are all going to be wearing our suits."[12] According to the latest obtainable figures, over 7.3 million suits with the Blücher/Tex-Shield Saratoga™ fabric system have been sold to 32 nations, and approximately 85 percent of all breathable chemical protective clothing sold world wide is from Blücher/Tex-Shield. The thousands of .02 inch carbon beads can individually trap up to .6 square feet of toxin each, in fact making possible for the wearer to endure up to 24 hours exposure in the suit without changing and before the NBC protection is compromised. The carbon-based beads are a molded layer that is placed between a face fabric and a lining fabric. The face fabric is a nylon/cotton blend that is used for enhanced liquid repellent properties. Air can come in and perspiration can escape without compromising the protection of the carbon sphere layer.

Although not the first breathable technology, it is the "newest, most rigorously tested and most highly protective, breathable technology used by the US Department of Defense. It remains (in 2007) the only air permeable technology approved by the US Joint Services."[13] Previous breathable technologies were inferior as they were less heat and toxin protective than Blücher/Tex-Shield Saratoga™, and also less permeable.

The JSLIST suit (Figure 20) is manufactured with the Saratoga™ fabric technology to the US armed forces design and specifications with a camouflage nylon/cotton rip-stop face fabric. The design specifications are provided to Blücher/Tex-Shield by the Department of Defense and they are manufactured with Sartoga™ fabric by outsourced companies.

Also available is the Hammer suit, developed at the request of a federal law enforcement agency after the success of the JSLIST suit. The

Hammer suit is available in the same two-piece design as the JSLIST, and also a one-piece jump suit version. It is sold primarily to EMS workers and police forces.

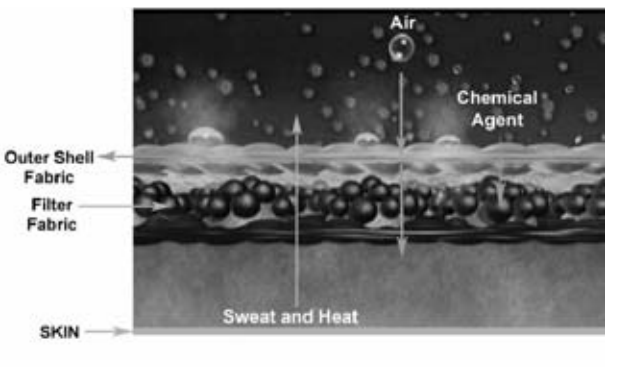

Figure 19.

Figure 20.

In addition to these products, recent US presidents have worn special protective undergarments made from Saratoga™ fabric technology.

DuPont and Gentex

DuPont and Gentex are both companies involved in the manufacture of items related to body armor as noted above. In addition, both companies are manufacturing NBC and heat protective clothing intended for both civilian and military applications.

DuPont has a very large line of protective suits made from Tyvek® non-woven porous polyethelene fabric. They have a wide range of levels intended for a variety of applications from light protection in industrial situations, the Tychem® Classic, to hazmat versions that are coated with polymers for high level chemical and biological protection. The US Army Technical Escort Unit has been wearing the DuPont Tychem® F version.

DuPont Nomex® is their most significant heat and flame technology. It will not melt or drip and can withstand heat up to 370° C. It is used by our armed forces to protect from fire and explosives, particularly for aircrews and tank crews at risk for fireball threats. Woven Nomex® fibers are also used to creating suits that combine the flame and heat protection with breathable NBC protection using a carbon inner layer.

Gentex features Rampart chemical protection suit. Although not approved for LSLIST use, the Rampart suits use a launderable carbon bead layer system, similar to Blücher/Tex-Shield Saratoga™. The face is Gentex's Lifetex® Defense fabric, a rip-stop nylon/cotton blend with a water and oil resistant protective finish. The 2 piece Rampart suit was originally designed for the US Department of Energy SWAT. It is advertised as being more form fitting than the DOD JSLIST Suit. It is available in solid navy and can also be special ordered in woodland and desert camouflage. The Gentex website asserts that, as with the JSLIST suit, the Rampart suit "provides the wearer protection against all known chemical and biological agents in a system which is lightweight, launderable and imposes the lowest possible level of heat stress for a system of its type."[14]

Gentex is also the global leader in aluminized fabric technology, with the trade name Dual Mirror Aluminized, that is specifically for flame resistance for fire fighting and molten metal splashing in industry. Additionally, Gentex announced last year a partnership with HaloSource Inc, specialist germ killing technologies, for the development of new NBC protective clothing using their HaloShield® technology. The technology uses "common halogens – chlorine or bromine – to neutralize chemical and biological agents."[15]

Natick Institute futurefForce warrior

The Natick Institute devotes itself to the development of nearly everything related to the US Soldier. In addition to his or her other basic needs, everything that the soldier wears is of concern to the institute. The Natick Institute has a very direct involvement in the development and refinement of protective clothing technologies, and is continually working with manufacturers of NBC protection, body armor, and other related gear. The Smithsonian's recent Extreme Textiles exhibit featured the Natick Institute Future Force Warrior. The Future Force Warrior was developed under the Institute's Individual Protection Directive and combined technology from several partners from the industry.[16] Significant attention is paid to the nature of missions and field requirements, and variations of the basic ensemble are created for different services and tasks. It is a state-of-the-art ensemble of protective pieces, including the NBC protection and body armor mentioned, and also includes the usage of smart textile

technologies. Weight is of particular concern, and lightweight alternatives to heavier components have been developed to reduce fatigue and for increased ease of movement. The technologies are continually developing and adapting, but the exact specifications of future developments are classified information. The combined protective elements of the Future Force Warrior could possibly represent the highest achievement in battle protection in our time.

Amulet symbols in the contemporary world

Growing global unrest at the dawn of the third millennium is happening simultaneously with the growth of neo-paganism. Advances in protection technologies are happening simultaneously with revival of body arts, and the increased popularity of wearing ancient spiritual amulets in western culture. Wearing large scaled amulets as fashion accessories has increased during the later part of the 20th century, perhaps beginning with the popularity of the ankh in the 1970s. The wearing of such ancient amulets continues to grow in usage. The application of amulets to protective garments is a very possible eventuality when looked at in the context of the history of armor.

Amuletic body arts

The revival of body arts in our time, including the growth in popularity of tattooing in recent years has often combined with the renewed usage of amulet symbols. Images such as the Eye of Horus and the aegishjálmur are commonly present in contemporary tattoo design. Body arts and the amulet symbols are being worn for their spiritual and mystical protective powers. Maureen Mercury in her work *Tribal Fleshworks* focuses on the spiritual experience of body arts. Mercury states that body arts are experiencing a resurgence of popularity in our contemporary culture because of a human need to reconnect and reanimate links to a larger cosmology, and many of these body markings are applied for their amuletic and spiritual purposes.[17]

The Cross and the Crescent

Could religiously motivated sectarian violence characteristic of the jihadist nature of some of today's conflicts be a contributing factor to the recurrence of religious symbols on military protective garments? The crescent moon (or hilal) symbol, already appears on the flags of many Muslim countries and by extension already appears on their military

uniforms. At what point does this go over the line between being an indicator of national identification and become a symbol of sacred power? At what point can this be compared to the Templars wearing their cross-adorned tabards? A similar phenomenon can be seen among European countries such as Sweden and Switzerland that incorporate the sign of the cross into their flags. In fact these two symbols – the cross and the crescent – have been deemed so sectarian and politically charged, the International Red Cross has recently adopted a third symbol, the Red Crystal, as a politically correct alternative (Figure 21).

Figure 21.

Protective clothing inspired fashion

The affect of armor and military clothing on high fashion was recently the theme documented by the exhibition *Love and War: The Weaponized Woman* at the Museum at FIT. Included was the well-known camouflage dress from John Galliano from 2001 (Figure 22). The continued ubiquity of camouflage in both high fashion and street fashion underlines any developing link between military protective clothing and fashion. During the Vietnam War, the wearing of camouflage by a civilian was intended as a political statement. In today's fashion world, camouflage has now become a staple. Fashion forecaster David Wolfe of the Doneger Group states that "camouflage has morphed from the military to anti-fashion into the fashion mainstream and is now perceived as a 'basic' print along with mundane polka dots and stripes."[18] The development of camouflage from its origins during World War I to its status as a fashion staple is the topic of a current exhibit at London's Imperial War Museum. (23 March 2007 to 18 November 2007.

Several fashion collections in recent seasons have been touted for their obvious inspirations from armor and military clothing. This goes beyond, for instance, Ralph Lauren taking rather benign inspiration from 19th century uniforms in 1990. Instead the image is dark, such as Thiery Mugler's futuristic warrior Robot Ensemble of 2005, the overt armored heroine of John Galliano's Fall 2006 collection for Dior, the protective

eyewear used in the militaristic styles of Nicolas Ghesquire's Spring 2007 Balenciaga collection, or the look of segmented armor combined with smart textiles in the Spring 2007 collection from Hussein Chalayan.

The opposite effect – that of fashion's influence on protective clothing – is also present. Technical designers with fashion school training are employed by world governments to create the specs for NBC protective clothes. Uniform designs are constantly being updated with unavoidable influence from mainstream fashion. The adoption of camouflage into urban chic now imbues the camouflage-clad soldier with greater sex appeal and fashion forwardness.

Marketing of protective clothing to the general public

After the events of September 11 2001, the uneasy global political climate is impossible to ignore. The news media gave instructions to New Yorkers on how to use duct tape and plastic sheeting, even trash bags to seal off their apartments in the event of a dirty bomb. The sale of chemical protective masks and NBC protective suits is already present all over the internet.

Items that were originally marketed only to industries that would require chemical protection are very readily accessible and have been for a while. A Google search on 'hazmat', 'chemical warfare clothing', or 'body armor' will quickly reveal how easy it is for any of us with the right amount of buying power to purchase these things for 'home use.' Google even offers the internet shopper sponsored links from these searches. A recent search on ebay yielded "US ARMY Chemical Protection Suit, Size Large, Unopened." The item had an opening bid of $5.00 and a "Buy it Now" price of $10.00. Authentic Traders.com recently featured a Russian Army chemical protection rain suit for $14.95. Visiting the Fisher Scientific website, one can purchase DuPont Tychem® suits at the price of $431.59 for a case of six. Diamondback Tacticle.com retails state of the art NBC protection masks, body armor, and Tex-Shield Hammer suits. The website Medgadget.com, in June of 2006 featured a child's size hood unit for the threat of a terrorist attach, available at web retailer Spycatcher of Knightsbridge.

> "…since we live in the unpredictable times of global terrorism and WMDs, I fully endorse the idea of protecting our smallest loved ones from the untold horrors of war. This hood is designed for children of 3 to 8 years old. The kit protects the head and the respiratory system. It is

> comfortable to wear and allows a wide field of vision. The kit includes a blower airflow unit, which creates positive pressure thus preventing contaminated air from entering the hood. Supplied with a drinking tube and powered by 4 x 123A (3v.) Lithium batteries. Supplied in an easy to carry case with a handle and shoulder strap."

The child's hood is available for £395.00 including the VAT. Purchase is a mere mouse click away.

Our society could quite possibly be one terrorist dirty bomb away from the marketing of such apparel at places like Sears, Target or Kmart; this is really just one small step beyond where society is now with extremely easy access to these garments via the internet.

Will the journey that body armor and NBC clothing take be similar to armor, with its interrelationship with fashion influences, and even spiritual talismanic symbols?

Figure 22.

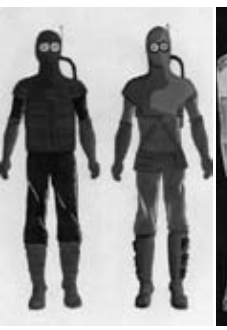

Figure 23.

Figure 24.

Figure 25.

Looking into the future

If these items are available now on the internet for civilian use, and in all likelihood will be available in retail chains in the near future, is it then indeed possible that the higher end designer versions of such garments, affordable to only the elite, will eventually be in 'protection collections' departments at the likes of Neiman Marcus, Barney's or Holt Renfrew? As farfetched as that assertion may sound, wouldn't that certainly be a likely outcome? If these outfits continue to transfer from techno warfare to civilian usage, could sending them down the runway be in our future? Could Roberto Cavalli someday be doing delightful appliqué patterns on NBC suits under a licensing agreement from Blücher/Tex-Shield? As the Saratoga™ and other carbon bead technology materials can potentially be used with other face fabrics

without compromising their performance, perhaps silk taffeta versions could be created for attending the opera while coping with dirty bomb fallout or an anthrax scare.

This design question was recently posed to Fashion Institute of Technology students in the BFA course *Conceptual Thinking*. 'Designer' NBC protection collections were created incorporating both technology and fashion trends (Figures 22, 23, 24, 25).

South Pacific tribal protective tattoo designs could easily transfer to a JSLIST suit (Figure 26). Perhaps the hamsa or the aegishjálmur could find their way to be the grillwork on the front of a chemical protection mask (Figure 27). In today's world, one cannot be too careful, and possibly combining both the practical aspects and the amuletic aspects of the Batterberrys' 'Protection' principal will be our best defense as we approach the future.

Figure 26.

Figure 27.

Illustration credits

1: Collection of the author
2: Collection of the author
3: Dover Books
4: Dover Books
5: The Metropolitan Museum of Art
6: The Metropolitan Museum of Art
7: Dover Books
8: Dover Books
9: The Metropolitan Museum of Art
10: The Metropolitan Museum of Art
11: Dover Books

12: Dover Books
13: The Metropolitan Museum of Art
14: Collection of the author
15: The Metropolitan Museum of Art
16: Courtesy of Pinnacle Armor
17: Courtesy of Pinnacle Armor
18: Courtesy of Pinnacle Armor
19: Courtesy of Tex-Shield, Inc.
20: Courtesy of Tex-Shield, Inc.
21: International Red Cross
22: Irving Solero, Museum at FIT
23: Courtesy Professor Sharon Rothman, FIT
24: Courtesy Professor Sharon Rothman, FIT
25: Courtesy Professor Sharon Rothman, FIT
26: Collection of the author
27: Collection of the author

Notes

1 Batterberry, Michael and Ariane (1977), *Mirror Mirror: A Social History of Fashion* (New York, Holt Rhinehart Winston)
2 ibid
3 Le Rocca, D. (1996), *The Gods of War: Sacred Imagery and the Decoration of Arms and Armor* (New York, Metropolitan Museum of Art)
4 Wikiperdia
5 Natick Soldier Institute
6 Defense Review.com
7 ibid
8 Soghoian, Mr. Matt, *Pinnacle Armor*: February – March 2007
9 Pinnacle armor website
10 Spruill, Clifton, et. al.
11 'Hitlers Man', *New York Times*
12 ibid
13 Nona Fahl, TexSheild, correspondence, January – February 2007
14 Website
15 Press release
16 Extreme Textiles
17 Mercury, Maureen, Pagan Fleshworks
18 David Wolfe, correspondence, March 2007

Bibliography

Batterberry, M. & Batterberry, A. (1977), *Mirror, Mirror: A Social History of Fashion* (New York: Holt Rinehart Winston)

Boucher, F. (1987), *20000 Years of Fashion* (New York: Abrams)

Braddock, S.E. & O'Mahony, M. (1998), *Techno Textiles: Revolutionary Fabrics for Fashion Design* (London/New York: Thames and Hudson)

Bull, S. & Summers, H.G. (1996), *20th Century Arms and Armor* (New York: Checkmark Books)

Camphausen, R.C. (1997), *Return of the Tribal* (Rochester, VT: Park Street Press)

Davenport, M. (1976), *The Book of Costume*, (New York: Crown)

Grant, R.G. (2005), *Battle* (New York: Dorling Kindersley)

Groening, K. (2002), *Decorated Skin* (London: Thames and Hudson)

Harrison, E.H. et. al. (2004, October), *Test Results of Air-Permeable Saratoga Hammer Suit to Challenge by Chemical Warfare Agents* Edgewood, MD: Edgewood Chemical Biological Center US Army Research Development and Engineering Command

Landler, M. (2003, April 8), 'Iraq War Profitable for Son of Hitler's Chemical Defense Corps', *New York Times*

LaRocca, D.J. (1996), *The Gods of War: Sacred Imagery and the Decoration of Arms and Armor* (New York: Metropolitan Museum of Art)

McNab, N. (1999), *Body Bizarre, Body Beautiful* (New York: Simon and Shuster)

Mercury, M. (2000), *Pagan Fleshworks* (Rochester,VT: Park Street Press)

Milleker, E. (ed.) (2000) *The Year One: Art of the Ancient World East and West* (New Haven: Yale University Press)

McQuaid, M. et. al. (2005), *Extreme Textiles: Designing for High Performance New York* (Smithsonian/Princeton Architectural Press)

Nickel, H. (1991), *Arms and Armor* (New York: Metropolitan Museum of Art)

Piponnier, F. & Mane, P. (1997), *Dress in the Middle Ages* (New Haven: Yale University Press)

Rubin, A. (1988), *Marks of Civilization* (Los Angeles: Museum of Cultural History, UCLA)

Sayre, C. (2007, February 5), 'Confusing Signs', *Time* 169, No. 6

Spruill, C.E., et. al. (1998, August), *Chemical and Biological Defense: Departmentof Defense's Evaluation of Improved Garment Materials*. (Washington, DC: United States General Accounting Office)

TexSheild, Inc. (2004, *Hammer Suit Protective Overgarment* (Product Sheet). (Washington DC: Tex-Shield, Inc)

TexSheild, Inc. (2004), *JSLIST Chemical Warfare Protective Overgarment* (Product Sheet). (Washington DC: Tex-Shield, Inc)

Tortora, P.G. & Eubank, K. (2005, 4th ed.), *A Survey of Historic Costume* (New York: Fairchild)

Webster, L. & Brown, M. (eds.) (1997), *The Transformation of the Roman World* (Los Angeles: University of California Press)

Internet Sources

American Body Armor Retrieved March 1, 2007 from: www.americanboidyarmor.com/

Army Fact File. *Joint Service Lightweight Suit Technology* (n.d.) Retrieved January 15, 2007, from: http://www.army.mil/fact_files_site/jslist/index.html

Bulletproof Vest (n.d.) *Wikipedia* Retrieved March 5, 2007, from: http://en.wikipedia.org/wiki/bulletproof_vest

Calgary Firm gets Body-Armor Order from US Marines (2007, February 20) *CBC News* Retrieved March 5, 2007 from: http://www.cbc.ca/momey/xtory/2007/02/20/body-armour/html

Chemical Protection (n.d.) *Authentic Traders* Retrieved February 1, 2007, from: http://www.authentictraders.com/myquery.aspx?query=chemical%20protection

Dragon Skin SOV Flexible Armor (n.d.) *Pinnacle Armor* Retrieved February 1, 2007, from http://www.pinnaclearmor.com/body-armor/dragon-skin.php

DuPont Tychem F Coveralls (n.d.) *Fisher Scientific* Retrieved 15 January, 2007, from: https://www1.fishersci.com/Coupon?gid=313898&cid=1342

The Emblems of the International Red Cross and Red Crescent Movement (2007, Jan 14) *International Red Cross* Retrieved February 25, 2007, from: http://www.icrc.org/Web/Eng/siteeng0.nsf/html/emblem

Fitzgerald, C. (2006, Winter) Future Force Warrior Leaps Ahead. *Natick Systems Soldier Center: The Warrior* Retrieved January 15, 2007, from: http://www.natick.army.mil/about/pao/pubs/warrior/index.htm#a2

A History of Body Armor (n.d.) *Inventors* Retrieved March 5, 2007, from: http://inventors.about.com/library/bioforesnic3.html

Hosfeld, S. (2006, October 25). These weapons of female seduction look the part. *Naples Sun Times* Retrieved January 30, 2007, from: http://www.zwire.com/site/news.cfm?brd=2605&pag=460&dept_ID=580544

Individual Equipment Systems (n.d.) *Armor Holdings AeroSpace and Defense Group* Retireved March 1, 2007, from: adg.armorholding.com/default.aspx

Lifetex® Chemical-Biological Defense Fabrics (n.d.) *Gentex* Retrieved February 1, 2007, from: http://www.gentexcorp.com/default.aspx?pageid=166

Nuclear/Biological/Chemical Protection for Kids! (2006, June 5) *Medgadget* Retrieved January 10, 2007, from: http://www.medgadget.com/archives/2006/06/nuclear_biologi.html

US ARMY Chemical Protection Suit, Size Large, Unopened.(n.d.) *eBay*® Retrieved January 11, 2007, from: http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=280076208533&ih=018&category=104023&ssPageName=WDVW&rd=1

Protection (n.d.) *Edgewood Chemical Biological Center* Retrieved March 1, 2007, from: http://www.ecbc.army.mil/

USMC Interceptor Multi-Threat Body Armor System Outer Tactical Vest (n.d.) *Natick Institute* Retrieved March 1, 2007

from:http://www.natick.army.mil/soldier/media/fact/individual/usmc_interceptorotv.htm

Interviews and correspondence

Fahl, Ms. Nona TexSheild, Inc.: January – February 2007.

Manley, Major John D., USMC, Ret.: November 2006 – February 2007.

Soghoian, Mr. Matt, Pinnacle Armor: February – March 2007.

Wolfe, Mr. David, The Doneger Group: March 2007.

Acknowledgements

Rebecca Akan, The Metropolitan Museum of Art

Celia Baez, Fashion Institute of Technology

Elisbeth Castillo Fashion Institute of Technology

Major John D. Manley, Retired United States Marine Corp

Marie Peppard, Fashion Institute of Technology

Sharon Rothman, Fashion Institute of Technology

David Saunders, TexSheild

Matt Soghoian, Pinnacle Armor

Karen Scheetz, Fashion Institute of Technology

About the author

Daniel James Cole is Adjunct Assistant Professor of Fashion Design at Fashion Institute of Technology (State University of New York.) His research specializations include Christian Church Vestments and other religiously motivated dress. Professionally he is also active as a costume designer, working primarily in opera.

danielcoledesign@cs.com

Fashion Institute of Technology
Seventh Avenue at 27th Street
Fashion Design – Art, Suite B801
New York, NY 10018, USA